Article 34

Claims

1. Method for setting the toner concentration of a toner particle-carrier particle mixture (26) in a developer station (22) for the development of a latent charge image on an intermediate carrier (10) of an electrographic printer or copier, in which

   a sensor (42) arranged in the developer station (22) measures the toner concentration in the mixture (26),

   an actuator (40, 42) adjusts the toner feed in the developer station (22),

   a current consumption value (68) for toner particles is determined,

   the toner concentration at a location (C) (deviating from the installation point) in the developer station at which the toner is extracted for development of the latent image is calculated from the toner concentration measured at the installation point (B) of the sensor (42) and from the toner consumption value (68),

   the calculated toner concentration at the toner extraction location (C) is input as a control variable in a regulation unit (74), and the regulation unit (74) activates the actuator (40, 42) such that the calculated toner concentration at the toner extraction location (C) approaches a desired value.

2. Method according to claim 1, in which the consumption value (68) is estimated.

3. Method according to claim 1 or 2, in which the actuator (38, 40) is controlled by the combination of a first manipulating variable (82) and a

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second manipulating variable (78), whereby the first manipulating variable (82) is proportional to the toner consumption value (68) and the second manipulating variable (78) is proportional to the measured toner concentration.

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4.   Method according to claim 3, in which the actuator 38, 40) [sic] is controlled by the sum of a first manipulating variable (82) and a second manipulating variable (78), whereby the first manipulating variable (82) is proportional to the toner consumption value (68) and the second

10   manipulating variable (78) is proportional to the measured toner concentration.

5.   Method according to claim 3 or 4, in which the first manipulating variable (82) is measured such that it effects a toner feed that corresponds to the

15   current toner consumption value (68).

6.   Method according to claim 3, 4 or 5, in which the second manipulating variable (78) is measured such that it regulates the toner concentration to a desired value.

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7.   Method according to any of the preceding claims, in which the toner feed set at the actuator (38, 40) is assumed as a toner consumption value (68).

8.   Method according to any of the claims 1 through 6, in which the toner

25   consumption value (68) is estimated from print data.

9.   Method according to claim 8, in which the toner consumption value (68) is estimated from the number of pixels to be printed, weighted with their inking level.

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10. Method according to any of the claims 1 through 6, in which the toner consumption value (68) is estimated from the number of the pixels, weighted with their inking level, that are set in the character generator (16) generating the latent charge image.

11. Method according to claim 10, in which the pixels are counted with the aid of an application-specific integrated circuit (88) that is connected with the character generator (16).

12. Method according to any of the claims 1 through 6, in which the toner consumption value (68) is estimated using the current consumption of the character generator (16) generating the latent charge image.

13. Method according to any of the claims 8 through 12, in which the determined toner consumption value (68) is stored in a data buffer (72) until inking of the corresponding print image.

14. Method according to any of the claims 3 through 13, in which the relative weighting of the first and second manipulating variable (82, 78) is carried in the course of the print or copy process.

15. Method according to claim 14, in which the second manipulating variable (78) is suppressed in the start phase of a print or copy process or its weighting is increased when the state of the mixture (26) in the developer station has stabilized.

16. Method according to any of the preceding claims, in which the regulation unit (74) comprises a PID controller (46).

17.   Method according to any of the preceding claims, in which the regulation parameters used by the regulation unit are varied in the course of the print or copy process.

5   18.   Device for the development of a latent charge image on an intermediate carrier of an electrographic printer or copier device, with

a developer station (22) in which a toner particle-carrier particle mixture (26) is located,

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a sensor (42), arranged in the developer station (22), to measure the toner concentration in the mixture (26),

an actuator (38, 40) to set the toner feed in the developer station (22),

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means (70, 88, 100) to determine a current consumption value (68) for toner particles and

a regulation unit (74) that, for regulation of the toner concentration,

20   activates the actuator (38, 40) dependent on the signal (50) of the sensor (42) and on the determined toner consumption value (68), in which regulation unit (74) are provided further means (66) that calculate, from the toner concentration measured at the installation location (B) of the sensor (42) and from the toner consumption value (68), the toner concentration at

25   a location (C) (deviating from the installation location) in the developer station at which the toner is extracted for development of the latent image, and

in which the calculated toner concentration at the toner extraction location

30   (C) can be input as a control variable into the regulation unit (74), and the regulation unit (74) is fashioned such that it activates the actuator (40, 42)

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such that the calculated toner concentration at the toner extraction location (C) approaches a desired value.

19. Device according to claim 18, in which the actuator (38, 40) is controlled by the combination of a first manipulating variable (82) and a second manipulating variable (78), whereby the first manipulating variable (82) is proportional to the toner consumption value (68) and the second manipulating variable (78) is proportional to the measured toner concentration.

20. Device according to claim 19, in which the first manipulating variable (82) is measured such that it effects a toner feed that corresponds to the current toner consumption value (68).

21. Device according to claim 19 or 20, in which the second manipulating variable (78) is measured such that it regulates the toner concentration to a desired value.

22. Device according to any of the claims 18 through 21, in which the toner consumption value (68) is estimated from print data.

23. Device according to claim 22, in which the toner consumption value (68) is estimated from the number of pixels to be printed, weighted with their inking level.

24. Device according to any of the claims 18 through 21, in which the toner consumption value (68) is estimated from the number of the pixels, weighted with their inking level, that are set in the character generator (16) generating the latent charge image.

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25. Device according to claim 24, with an application-specific integrated circuit (88), connected with the character generator (16), to count the pixels.

5 26. Device according to any of the claims 18 through 21, with a current measurement device 98 to measure the current consumption of the character generator (16) generating the latent charge image and means (100) for estimation of the toner consumption value (68) using the current consumption of the character generator (16).

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